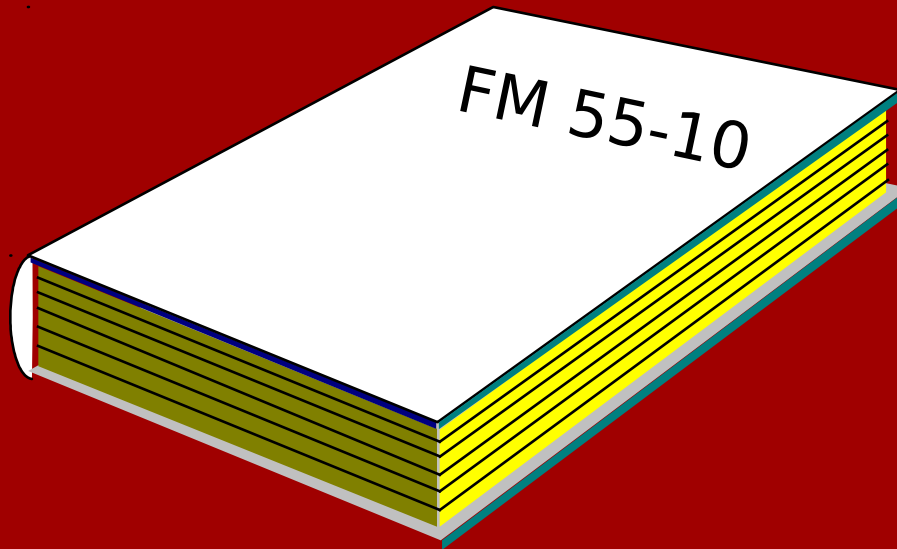




HIGHWAY REGULATION

DOCTRINE

FM 55-10 Movement Control in a Theater of Operations



PURPOSE

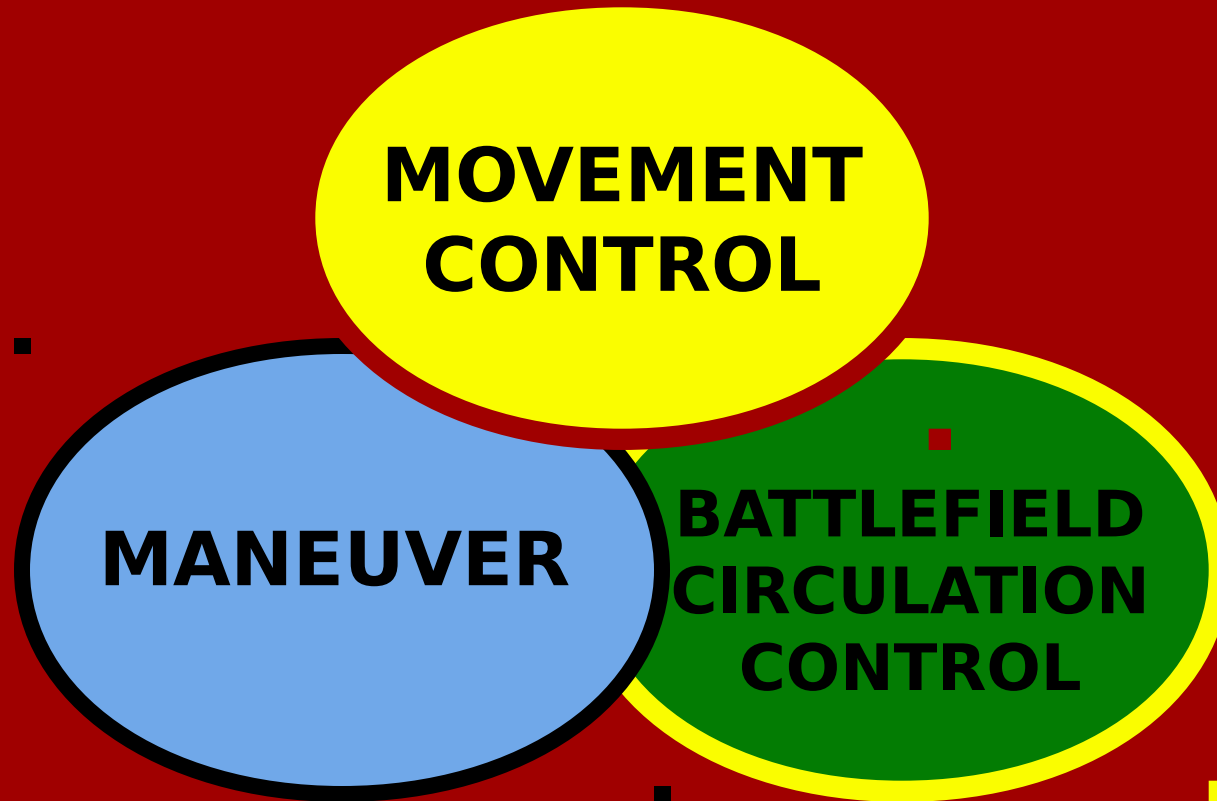
Provides order

Prevents congestion

**Enforces movement
priorities**

**Supports the concept of
operations**

MOVEMENT SYNCHRONIZATION COMPONENTS



MISSIONS

Planning

Routing

Deconflicting

Scheduling

PLANNING

Who plans Highway Regulation?

**TAMCA and Transportation Bn (MC)
for the theater area (COMMZ)**

MCC for the corps area

DTO for the division area

S-4 for the brigade area

PLANNING

ASSEMBLE CRITICAL INFORMATION

**Needs to answer: Who, What, Where,
and How is something moving?**

Resource Documents:

**Operation Plans, OPLANs, Estimates,
Engineer Route Recons or Classification
Overlays, Traffic Density Information
Facilities and Terminal Information**

PLANNING

Planned Requirements

Identified and Planned in Advance
Source Documents:

- ☐ **Movement Programs**
- ☐ **Estimates**
- ☐ **OPLANs**
- ☐ **Operation Orders**
- ☐ **FRAGOs**

PLANNING

Immediate Requirements

Generated during conduct of operations

Examples:

Unit Displacement

Unprogrammed resupply

Evacuation

Allied or Host Nation support

PLANNING

Assemble Supporting Information

ROUTES

TRAFFIC DENSITY

TERMINALS & FACILITIES

COMMUNICATIONS

WEATHER

INTELLIGENCE

CONCEPT of OPERATION

MAIN SUPPLY ROUTES (MSRs)

**Capable of supporting traffic
volume**

Normally the best routes

Must include Alternate routes

**Recommended by the
Movement Planner**

Approved by the G-3

MSR PLANNING SEQUENCE

- 1. Name each MSR**
- 2. Determine critical points**
- 3. Establish checkpoints**
- 4. Establish control measures**
- 5. Develop a Traffic Circulation Plan**
- 6. Write the Highway Regulation Plan**
- 7. Establish reporting instructions**
- 8. Staff and coordinate**

MSR PLANNING SEQUENCE

Establish Control Measures

OPEN ROUTE:

No restrictions
No scheduled
movements



MSR PLANNING SEQUENCE

Establish Control Measures

SUPERVISED ROUTE:

Limited control

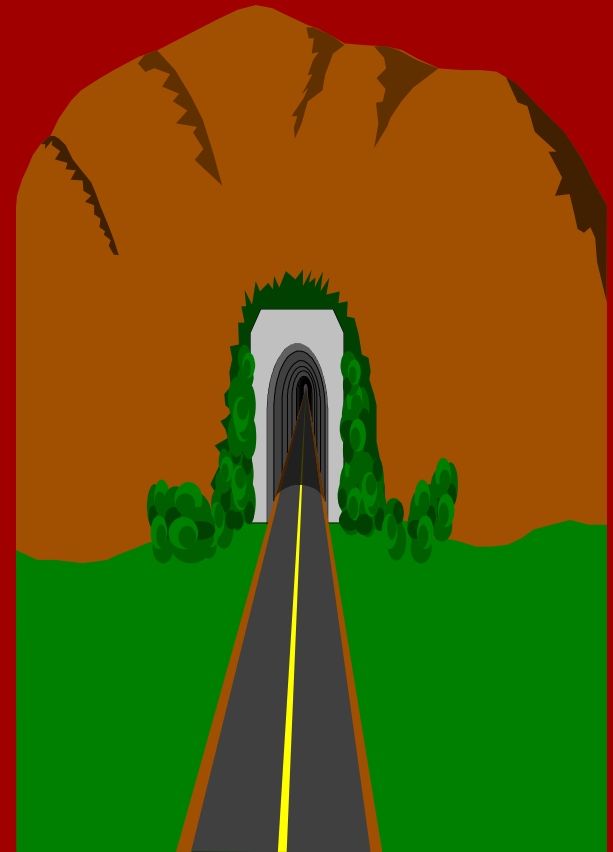
**Move credit required
for:**

Convoys of a certain size

Outsized vehicles

Non-minimum speed
vehicles

**Access controlled by
TCP or MRT**



MSR PLANNING SEQUENCE

Establish Control Measures

DISPATCH ROUTE:

Full control

**All movements
require a move credit**



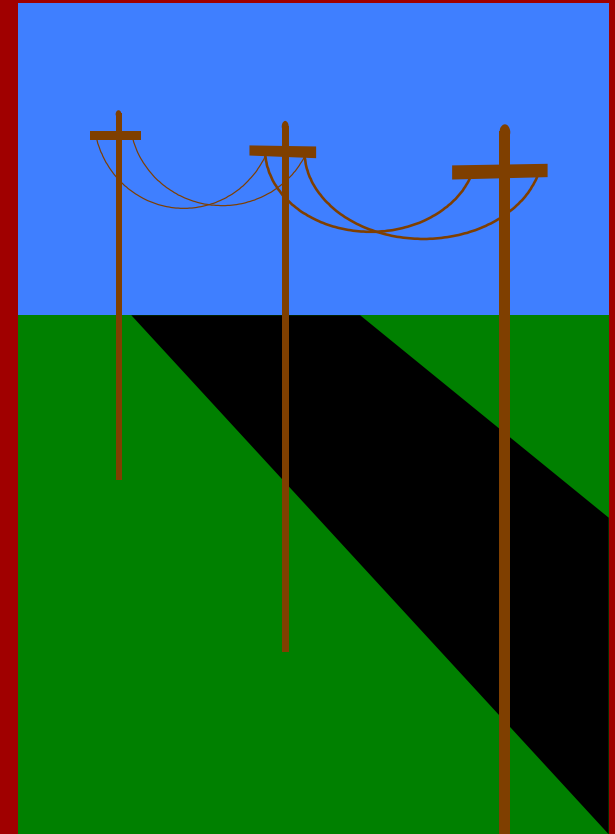
MSR PLANNING SEQUENCE

Establish Control Measures

RESERVED ROUTE:

Scheduled in time periods

For unit moves or type of traffic



MSR PLANNING SEQUENCE

Establish Control Measures

PROHIBITED ROUTE:

Closed to all traffic
due to:

Security

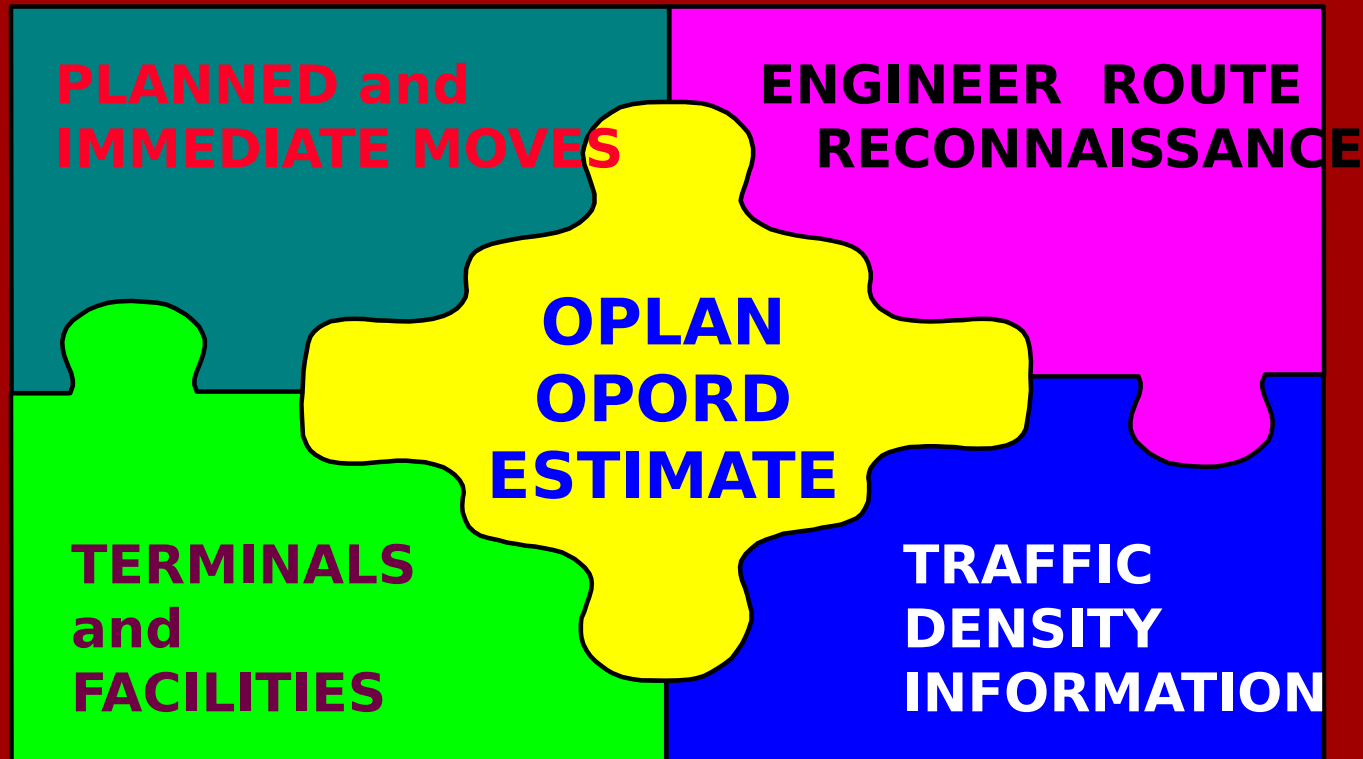
Weather

NBC contamination

Damage



Put it all together and.....



**develop the Traffic Circulation
Plan and Highway Regulation
Plan**

TRAFFIC CIRCULATION PLAN

Definition: A graphic representation of the highway network, usually in overlay form. It contains the following features:

Named MSRs and ASRs

Direction of travel

Checkpoints

Geographic boundaries

Major supply activities

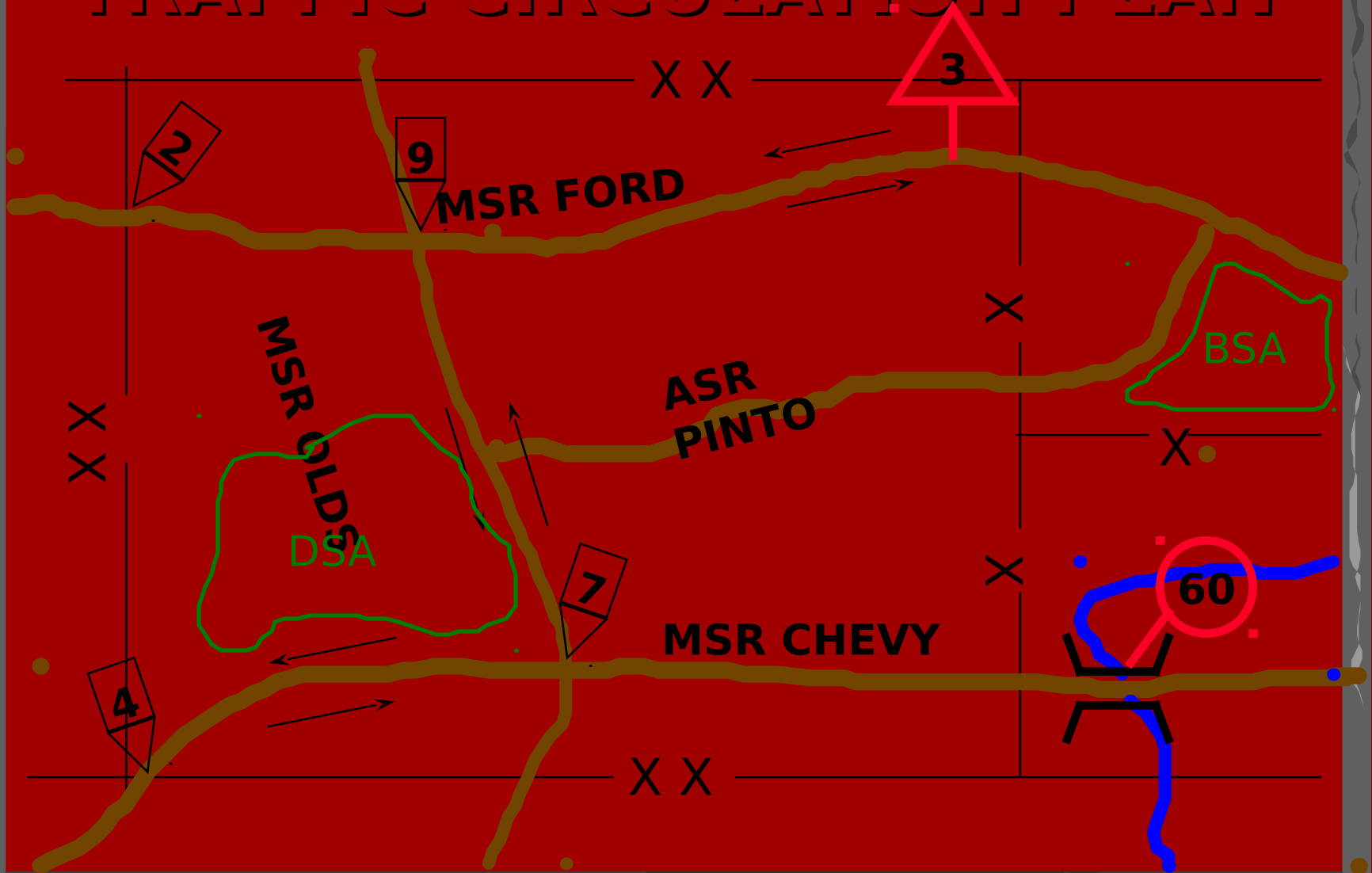
Critical points

Traffic Control Points (TCP)

Restrictive route features

Rest & refuel areas

TRAFFIC CIRCULATION PLAN



HIGHWAY REGULATION PLAN

Definition: A staff plan to be included in the OPLAN or OPORD. It describes the utilization of the highway network, control measures, and other routing and scheduling information.

Development:

- Included in the OPORD or OPLAN**

- Describes the Traffic Circulation Plan**

- Describes control measures by segment**

- Describes scheduling procedures**

HIGHWAY REG PLAN

All MSRs will be strictly controlled as dispatch routes by the DTO for effective utilization by maneuver units and resupply convoys. Division controlled MSRs and ASRs will remain two way traffic until reprioritization or movement of maneuver units dictates change to one way.

HRP MSR DESCRIPTION

MSR LUMINA. MSR LUMINA is an all weather 2-lane hard surface road. It enters the Division rear boundary at TCP 50. MSR LUMINA travels west for 17km where it turns northwest vic UH974183. MSR LUMINA ends at MSR BUICK at TCP 37.

HRP CONTINUED

(1) DTO (DREAR)

(A) Overall coordinator for motor movements, movement control, preplanned logistics aircraft, convoy movement and transportation planning.

(B) Has the movement authority over all convoys moving along Division MSRs, as directed by the G-3.

(C) Control all MSRs forward of the division rear boundary. DTO will coordinate with the 330th MCC for movements outside Division boundaries.

ROUTING

Definition: Routing is the process of coordinating or directing movements on designated highway routes. These routes are normally designated as Main Supply Routes or Alternate Supply Routes.

Routing is governed by four principles and three fundamentals.

ROUTING

ROUTING PRINCIPLES

- 1. Assign highest priority traffic to routes that provide the minimum time-distance.**
- 2. Consider the sustained capabilities of routes and bridges.**
- 3. Separate motor movements from pedestrian movements.**
- 4. Separate civilian traffic from military motor movements.**

ROUTING

ROUTING FUNDAMENTALS

- 1. BALANCE:** Match vehicle characteristics with route characteristics.
- 2. SEPARATION:** Allocate road space to prevent conflicts.
- 3. DISTRIBUTION:** Spread traffic over a variety of routes.

SCHEDULING

Definition: The process of coordinating times for road movements.

Procedures may require movement bids, deconflicting, and issuing movement credits.

Movements requiring scheduling:

Movement on routes requiring a movement credit.

Movements that cross boundaries.

Large unit moves

SCHEDULING
SCHEDULING METHODS

INFILTRATION

LOCATION

ROUTE

COLUMN

SCHEDULING

INFILTRATION METHOD

Used for OPEN or SUPERVISED routes

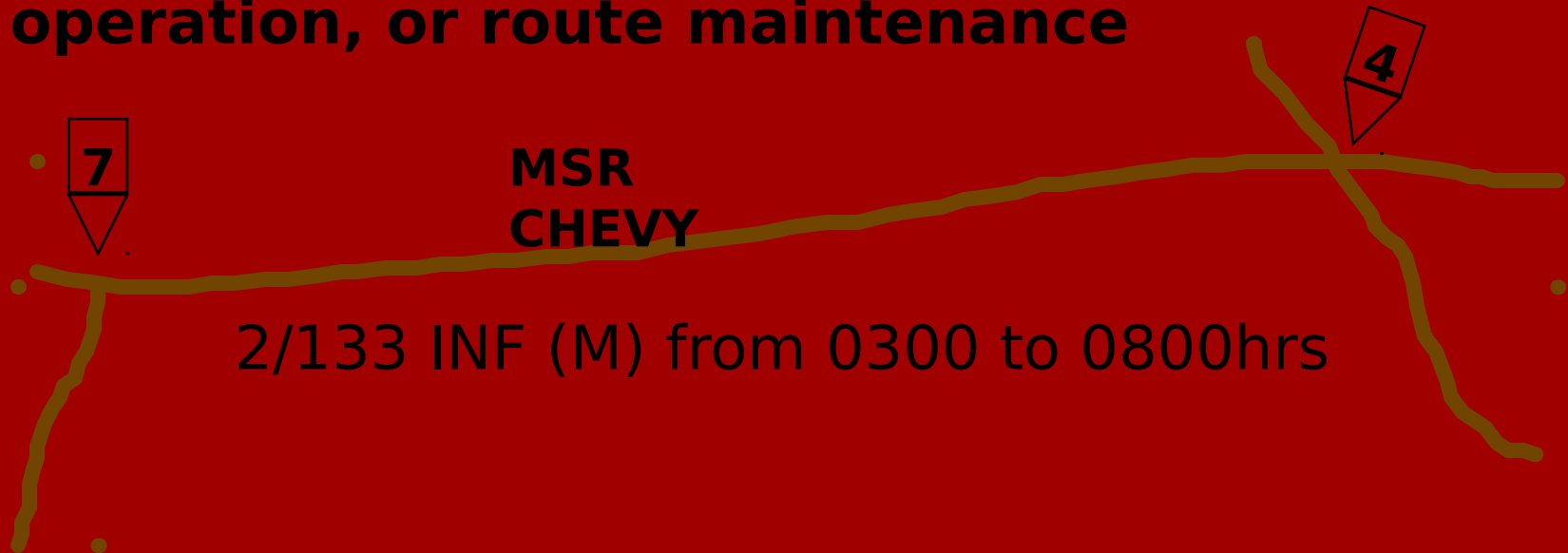
A rate of dispatch is assigned to units for specific routes and time blocks in order to achieve an average traffic flow that is within the capacity of the route

Least restrictive scheduling method

SCHEDULING **ROUTE METHOD**

Used for **SUPERVISED, DISPATCH** or **RESERVED** routes

Apportions blocks of time on **MSRs** to units, types of movements, Phases of an operation, or route maintenance



SCHEDULING LOCATION METHOD

Used for SUPERVISED or DISPATCH routes

Assigns arrive and clear times to
different units needing to use the same
entry point on an MSR



SCHEDULING

COLUMN METHOD

Used for SUPERVISED or DISPATCH routes

Specifies arrival and clearance times at all checkpoints along the entire route.

Most restrictive scheduling method



SCHEDULING

CALCULATE ARRIVE TIME

Arrive time = Distance / March rate X 60 min

EXAMPLE: A march unit departs the SP at 0800. The distance to the next checkpoint is 12km. The rate of march is 36kmih. What time will the march unit arrive at the next checkpoint?

ROUND UP TO THE NEXT WHOLE MINUTE

SCHEDULING

CALCULATE ARRIVE TIME

Arrive time = Distance / March rate X 60 min

EXAMPLE: A march unit departs the SP at 0800. The distance to the next checkpoint is 12km. The rate of march is 36kmih.

What time will the march unit arrive at the next checkpoint?

SOLUTION: $12 / 36 \times 60 = 20$ minutes

The arrive time at the next

SCHEDULING

CALCULATE CLEAR TIME

The clear time of a moving element is the time on a clock when the rear end of the last vehicle of a march element passes by a point on the route.

Clear time is calculated from the following factors:

DENSITY of the moving element's vehicles

Total TIME GAPS between elements

Total ROAD SPACE of the moving element

PASS TIME of the moving element

SCHEDULING

CALCULATING CLEAR TIME

DENSITY: Is the average number of vehicles in a distance of one kilometer.

$$\text{DENSITY} = \frac{1,000 \text{ m/km}}{\text{Gap} + \text{Avg Length of each Vehicle}}$$

ROUND TO THE NEAREST WHOLE VEHICLE

SCHEDULING

CALCULATING CLEAR TIME

TIME GAPS: Are the sum total of all gaps of time between each moving element.

TIME GAPS =

$$[(\text{Number of march units} - 1) \times \text{March unit Time gap}] + [(\text{Number of serials} - 1) \times (\text{Serial time gap} - \text{March unit time gap})]$$

THE ANSWER MUST BE A WHOLE NUMBER

SCHEDULING

CALCULATE CLEAR TIME

ROAD SPACE: Is the length of road in kilometers that an entire convoy or any element occupies at any given moment.

ROAD SPACE =

$$\frac{\text{Number of vehicles}}{\text{DENSITY}} + \frac{\text{TIME GAPS} \times \text{March rate}}{60 \text{ minutes}}$$

ROUND TO NEAREST TENTH KILOMETER

SCHEDULING

CALCULATE CLEAR TIME

PASS TIME: Is the amount of time it takes an element from the first vehicle to the last vehicle moving at a rate of march to pass a point on a route.

$$\text{PASS TIME} = \frac{\text{ROAD SPACE} \times 60 \text{ MINUTES}}{\text{March rate}}$$

ROUND UP TO THE NEXT WHOLE MINUTE

SCHEDULING

CALCULATE CLEAR TIME

Example: A convoy departs the SP at 0800.

The distance to the first checkpoint is 12 km. The march rate is 36 kmih. What time will the convoy arrive and clear the first checkpoint?

Total vehicles = 100

Vehicle gap = 50 meters

Avg Veh Lgth = 8 meters

March unit time gap = 5 minutes

Serial time gap = 10 minutes

Total march units = 5

Total serials = 2

SCHEDULING

CALCULATE CLEAR TIME

$$\text{DENSITY} = \frac{1,000}{50 + 8} = 17.24 = 17 \text{ Vehicles}$$

SCHEDULING

CALCULATE CLEAR TIME

$$\text{DENSITY} = \frac{1,000}{50 + 8} = 17.24 = 17 \text{ Vehicles}$$

TIME GAPS=

$$\begin{aligned} &[(5-1) \times 5] + [(2-1) \times (10-5)] = [4 \times 5] + [1 \times 5] \\ &= 20 + 5 = 25 \text{ minutes} \end{aligned}$$

SCHEDULING

CALCULATE CLEAR TIME

$$\text{DENSITY} = \frac{1,000}{50 + 8} = 17.24 = 17 \text{ Vehicles}$$

TIME GAPS=

$$[(5-1) \times 5] + [(2-1) \times (10-5)] = [4 \times 5] + [1 \times 5] \\ = 20 + 5 = 25 \text{ minutes}$$

$$\text{ROAD SPACE} = \frac{100}{17} + \frac{25 \times 36}{60} = 5.88 + 15 \\ = 20.9 \text{ km}$$

SCHEDULING

CALCULATE CLEAR TIME

$$\text{DENSITY} = \frac{1,000}{50 + 8} = 17.24 = 17 \text{ Vehicles}$$

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$$\text{PASS TIME} = \frac{20.9 \times 60}{36} = 34.8 \text{ or } 35 \text{ minutes}$$

SCHEDULING

CALCULATE CLEAR TIME

$$\text{DENSITY} = \frac{1,000}{50 + 8} = 17.24 = 17 \text{ Vehicles}$$

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$$\text{PASS TIME} = \frac{20.9 \times 60}{36} = 34.8 \text{ or } 35 \text{ minutes}$$

The clear time would be 0820 + 35 minutes or 0855

DECONFLICTING

METHODS:

Hold movements not yet begun

Hold a unit at an enroute checkpoint

Reroute onto another MSR or ASR

**Deconflictions during movement are
reliant upon good communications
between the Provost Marshal,
Movement Regulating Teams and the
moving unit.**

KEYS TO SUCCESS

Extensive planning and coordination.

Deconflict critical road junctions.

Evaluate lower priority requirements.

Engineers upgrade routes and bridges.

Use proper scheduling techniques.

Smaller units need detailed movement tables to execute their portion of the plan.